

APPENDIX B

Finfish Tissue Contaminant Sample and Quality Control Data

Part II

QA/QC Summary

QUALITY ASSURANCE STATEMENT**Project Title:** USACE/NAE Rhode Island Sound Tissue 12 WHO PCB Data, Batch 1**Project Number:** G487001-T7FISHBCL**Description of Data:** Tissue samples for 12 WHO PCB Data**Description of audit and review activities:**

- 1)Reviewed sample preparation Laboratory Record Books (LRB). Tracked COC from sample receipt to analytical injection. Reviewed standard/spike preparation records. Resolved all resulting LRB numbers (i.e. sample tracking numbers) with analytical designations. Reviewed data package for data recording consistent with the QAPP and department SOPs.
- 2)Reviewed analytical (HRMS) data. Reviewed all hand-entered parameters (e.g. sample masses, sample names, calibration curve date, etc) for each analytical run. Reviewed calibrations results to ensure that Relative Response Factors (RRF) were $\pm 20\%$ of calibration RRF. Reviewed 10% data transfer to spreadsheets. Reviewed confirmation runs and accurate data transfer.
- 3)Reviewed spreadsheets. Accessed e-file of excel spreadsheets and reviewed formula and relative and absolute cell addresses to ensure accurate data transposition.
- 4)Reviewed report. Ensured report accurately reflected raw data and resulting spreadsheets.

Description of outstanding issues or deficiencies which may affect data quality:

- 1) Minor QC issues were submitted to the analytical staff for correction, no outstanding issues present.

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Battelle

2-25-02

Date

Rhode Island Sound
12 WHO TISSUE SAMPLES QA/QC SUMMARY
QC Batch 49170-19

PROJECT: USACE NAE Delivery Order #2 Rhode Island Sound
PARAMETER: 12 WHO PCB congeners by High Resolution Mass Spectrometry (HRMS)
LABORATORY: Battelle, Columbus, OH
MATRIX: Tissue
SAMPLE CUSTODY: Homogenized tissue samples of two types (fish and liver) were received at Battelle Columbus on January 18, 2002. Samples were received in good condition and the cooler temperatures upon receipt was 1.2°C.

QA/QC MEASUREMENT PERFORMANCE CRITERIA:

	Reference Method	Blank	Surrogate Recovery	LCS/MS Recovery	SRM % Diff.	MS/MSD	Achieved EML (pg/g dry)	Project QL Goals ^d
						Replicate Relative Precision		
12 WHO PCB	L-32 Battelle SOP ASAT.II-001-09	<5× MDL, or associated samples >10x blank values	25-150% Recovery	LCS: 50-150% ^a MS/MSD: 50-150% Recovery for at least 90% of the congeners ^b	≤30% PD ^c	≤30% RPD ^{b,c} for at least 90% of the congeners	MDL listed for each sample is EML from 1688A table 2 adjusted for the amount of sample extracted	Selected congeners range from 216.98 – 16,417.60

^a Method 1668A, Table 6 OPR requirements for native PCBs.

^b Analyte concentration in MS/MSD must be >5× background to be used for data quality assessment.

^c Certified values must be >3× the EML.

^d values from Table 9b (p 82 of QAPP) adjusted for sample weight and final extract volume

METHOD: Tissue samples were processed and analyzed for the 12 WHO PCB congeners following methods outlined in the Rhode Island Sound Disposal Site Study, Delivery Order Number 02 QAPP (9/12/01) and as summarized below. Briefly,

Sample Preparation – Aliquots of each homogenized tissue sample were weighed into individual jars and mixed with Hydromatrix drying agent. Approximately 5-10 g wet weight of each tissue sample was used. The six samples plus nine QC samples were prepared for PCDD/PCDF and PCBs. The tissue/hydromatrix mixtures were placed into Soxhlet apparatus and spiked with ¹³C₁₂-labeled PCDD/PCDF and labeled PCB internal standard solutions. Matrix spike, matrix spike duplicate, and laboratory control (LCS) samples were spiked with native PCDD/PCDF and PCB at this time. Note that the samples received internal standard and matrix spike standards at twice the usual level to accommodate the sample being split in half for separate PCB and PCDD/PCDF cleanup. The Soxhlets were charged with MeCl₂: hexane (1:1) and allowed to extract for a minimum of 16 hours. Each extract was then spiked with ¹³C₁₂-labeled PCB cleanup standards for monitoring recovery of analytes through the cleanup procedures. Each extract was acid washed. After the acid wash step, the samples were split in half with half the extract submitted for PCB cleanup. The PCB cleanup process included

Rhode Island Sound
12 WHO TISSUE SAMPLES QA/QC SUMMARY
QC Batch 49170-19

METHOD
(cont): acid/base silica, alumina, followed by additional acid/base silica cleanup columns. The tissue extracts were spiked with $^{13}\text{C}_{12}$ -labeled PCB recovery standards and concentrated to a final sample volume of 50 μL .

PCB Analysis – Each extract was analyzed by gas chromatography/high resolution mass spectrometry (GC/HRMS) in the selected ion-monitoring mode at a resolution of 10,000 or greater. An SPB-Octyl column was used for analysis of the PCB congeners.

The continuing calibration met Method criteria at all times.

The following revisions to Method 1668A as well as several items to note specifically related to these analyses are summarized below:

1. Quality control samples processed with this batch of samples included one method blank, one LCS, one fish standard reference material, one matrix spike for each of the two tissue types, one matrix spike duplicate for each of the two tissue types, and one sample prepared in duplicate for each of the two tissue types.
2. The GC/HRMS instrumentation was calibrated for PCBs using a 6-point calibration of a subset of PCB congeners, which include all 12 of the WHO congeners, to assess linearity of the calibration range and generate a response factor. The calibration range corresponds to the following levels in the samples assuming an average sample wet weight of 3.5 g (taking into account the sample split) of tissue and a final sample volume of 50 μL : 2.86 to 28,600 pg/g wet.

Any additional minor revisions to Method 1668A are fully documented in the analytical record.

HOLDING TIMES: Samples were prepared for analysis in one analytical batch. Samples were extracted on the day of receipt at the laboratory and completely analyzed within 3 weeks of extraction.

Batch	Extraction Date	Analysis Date
49170-19	1/18/02	02/05-02/07/02

DETECTION LIMITS: PCB results are reported relative to the sample-specific reporting limits (listed as EML in the report tables) for that compound. The sample-specific RL is based on the method 1668A EML and adjusted for sample specific processing factors and volumes, as follows:

$$\text{RL} = (\text{EML}) / \text{Sample size}$$

Where,

$$\begin{aligned}\text{EML} &= (\text{pg/g EML value from Method 1668A, Table 2}) \times 10 \\ &\quad \text{to adjust for an assumed sample volume of 10 g in the table} \\ \text{Sample Size} &= \text{actual sample weight (approximately 3.5-g dry)}\end{aligned}$$

The QL listed in report tables is the Project QL Goal (QAPP worksheet 9b, p 92 of 408) adjusted for sample specific processing factors as follows:

$$\text{QL} = \text{QL goal} / \text{Sample size}$$

Rhode Island Sound
12 WHO TISSUE SAMPLES QA/QC SUMMARY
QC Batch 49170-19

Where,

QL goal = (pg/g dry QI Goal from QAPP table 9b, p 92) x 2.5 to adjust for an assumed sample size of 2.5 g in the table

Sample Size = actual sample weight (approximately 3.5-g dry)

Results that are below the sample-specific EML are flagged with a "U" on the summary tables and results that are found to be between the sample-specific EML and the sample-specific project QL are flagged with a "J".

- BLANKS:** One laboratory method blank was processed with the analytical batch. Blanks are analyzed to ensure that the sample extraction and analysis methods were free of contamination.
- 49170-19-** Most of the 12 WHO congeners were detected at a trace level as is common in low-level HRMS PCB analysis due to prevalence of PCBs in the environment contributing to the background; however the levels detected were below the action level of 5x EML.
- LABORATORY CONTROL SAMPLE** A laboratory control sample (LCS) was prepared with the analytical batch. The percent recoveries of target compounds were calculated to measure data quality in terms of accuracy.
- 49170-19-** The recovery of PCBs in the LCS sample were within the 50-150% criteria found in Table 6 of Method 1668A for all congeners except PCB-118 (168%) which was above the 150% limit.
- MATRIX SPIKES:** One matrix spike (MS)/matrix spike duplicate (MSD) sample set was prepared for each tissue type with the batch to measure data quality in terms of accuracy and precision. The MS and MSD were fortified with target compounds to monitor data quality in terms of accuracy and precision.
- 49170-19-** For PCBs, the matrix spike and matrix spike duplicate recoveries for analytes spiked >5X background concentration were within the 50-150% limits. The relative percent difference (RPD) between the MS and MSD for analytes spiked >5X background concentration was found to be <30%.
- INTERNAL STANDARDS:** Twenty-seven internal standards were added to each sample prior to processing, three standards were added after extraction and prior to sample cleanup. Note that only the internal standards that correlate to the 12 WHO congeners are reported. Internal standard recoveries were calculated to measure data quality in terms of accuracy (sample processing efficiency).
- 49170-19-** Recoveries of internal standards were within 25-150% for most of the analytes in all but two of the samples. The method blank and the LCS contained a few internal standard recoveries that were slightly below the 25% limit.
- REPLICATES:** A laboratory duplicate was prepared for each tissue type with the batch. The relative percent differences (RPD) between laboratory replicate analyses for target compounds were calculated to measure data quality in terms of precision.
- 49170-19-** The percent RPD for PCB congeners detected above the action level of >3X

**Rhode Island Sound
12 WHO TISSUE SAMPLES QA/QC SUMMARY
QC Batch 49170-19**

EML fell within the 30% limit.

SRM: A standard reference material (CIL EDF-2526) was prepared with the analytical batch. The percent difference (PD) between detected concentrations and certified values was calculated to measure data quality in terms of accuracy.

49170-19– All of the five PCB analytes contained in the SRM were within the <30% difference limit.

REFERENCES: Battelle 2001. *Rhode Island Sound Disposal Site Study*. Task 1 QAPP prepared under contract to USACE NAE. Delivery Order #02. September 12, 2001. 408pp + apps.

Sample Data

PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CROL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE	NORMAL
SAMPLE_NO	ZS25
SITE	69B
TISSUE TYPE	Fillet
FRACTION	T
SAMPLE_SIZE	4.9973
SAMPLE_SIZE_UNITS	G WET
PCT_LIPID	
SAMPLE_DATE	
EXTRACT_DATE	1/18/2002
LAB_EXTRACTION_ID	49170-19-02
LAB_ID	49037-38-03

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	0.84	PG/G WET U	100.05	152.38	2/6/2002	1.000	
32598-13-3	PCB-77	33.47	PG/G WET U	100.05	236.13	2/6/2002	1.000	
65510-44-3	PCB-123	20.08	PG/G WET U	100.05	395.51	2/6/2002	1.000	
31508-00-6	PCB-118	1463.52	PG/G WET J	100.05	2961.20	2/6/2002	1.000	
74472-37-0	PCB-114	15.48	PG/G WET U	100.05	203.61	2/6/2002	1.000	
32598-14-4	PCB-105	366.21	PG/G WET J	40.02	974.23	2/6/2002	1.000	
57465-28-8	PCB-126	8.27	PG/G WET U	200.11	109.16	2/6/2002	1.000	
52663-72-6	PCB-167	110.72	PG/G WET J	100.05	194.40	2/6/2002	1.000	
38380-08-4	PCB-156	162.50	PG/G WET JC	100.05	212.51	2/6/2002	1.000	
69782-90-7	PCB-157		PG/G WET C156	100.05	212.51	2/6/2002	1.000	
32774-16-6	PCB-169	2.36	PG/G WET U	100.05	149.88	2/6/2002	1.000	
39635-31-9	PCB-189	16.18	PG/G WET U	100.05	112.96	2/6/2002	1.000	
70362-50-4	13C-PCB-81	88	PCT_REC			2/6/2002	1.000	
32598-13-3	13C-PCB-77	84	PCT_REC			2/6/2002	1.000	
65510-44-3	13C-PCB-123	81	PCT_REC			2/6/2002	1.000	
31508-00-6	13C-PCB-118	77	PCT_REC			2/6/2002	1.000	
74472-37-0	13C-PCB-114	76	PCT_REC			2/6/2002	1.000	
32598-14-4	13C-PCB-105	83	PCT_REC			2/6/2002	1.000	
57465-28-8	13C-PCB-126	85	PCT_REC			2/6/2002	1.000	
52663-72-6	13C-PCB-167	88	PCT_REC			2/6/2002	1.000	
38380-08-4	13C-PCB-156	81	PCT_REC			2/6/2002	1.000	
69782-90-7	13C-PCB-157	81	PCT_REC			2/6/2002	1.000	
32774-16-6	13C-PCB-169	83	PCT_REC			2/6/2002	1.000	
39635-31-9	13C-PCB-189	108	PCT_REC			2/6/2002	1.000	
7012-37-5	13C-PCB-28	99	PCT_REC			2/6/2002	1.000	
39635-32-0	13C-PCB-111	77	PCT_REC			2/6/2002	1.000	
52663-67-9	13C-PCB-178	96	PCT_REC			2/6/2002	1.000	

J = Detected but below the Detection Limit

U = Not detected; RL reported

N = QC value outside the accuracy or precision criteria goal

C = co-elutes (applicable for PCB 156/157)

PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS_METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CROL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE	NORMAL
SAMPLE_NO	ZS22
SITE	69A
TISSUE TYPE	Fillet
FRACTION	T
SAMPLE_SIZE	5.0217
SAMPLE_SIZE_UNITS	G WET
PCT_LIPID	
SAMPLE_DATE	
EXTRACT_DATE	1/18/2002
LAB_EXTRACTION_ID	49170-19-03
LAB_ID	49037-38-02

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	0.91	PG/G WET U	99.57	151.64	2/6/2002	1.000	
32598-13-3	PCB-77	27.18	PG/G WET U	99.57	234.98	2/6/2002	1.000	
65510-44-3	PCB-123	16.97	PG/G WET U	99.57	393.59	2/6/2002	1.000	
31508-00-6	PCB-118	1313.20	PG/G WET J	99.57	2946.81	2/6/2002	1.000	
74472-37-0	PCB-114	15.15	PG/G WET U	99.57	202.62	2/6/2002	1.000	
32598-14-4	PCB-105	340.35	PG/G WET J	39.83	969.49	2/6/2002	1.000	
57465-28-8	PCB-126	5.96	PG/G WET U	199.14	108.63	2/6/2002	1.000	
52663-72-6	PCB-167	86.24	PG/G WET U	99.57	193.46	2/6/2002	1.000	
38380-08-4	PCB-156	136.36	PG/G WET JC	99.57	211.48	2/6/2002	1.000	
69782-90-7	PCB-157		PG/G WET C156	99.57	211.48	2/6/2002	1.000	
32774-16-6	PCB-169	1.47	PG/G WET U	99.57	149.15	2/6/2002	1.000	
39635-31-9	PCB-189	12.24	PG/G WET U	99.57	112.41	2/6/2002	1.000	
70362-50-4	13C-PCB-81	80	PCT_REC			2/6/2002	1.000	
32598-13-3	13C-PCB-77	76	PCT_REC			2/6/2002	1.000	
65510-44-3	13C-PCB-123	70	PCT_REC			2/6/2002	1.000	
31508-00-6	13C-PCB-118	68	PCT_REC			2/6/2002	1.000	
74472-37-0	13C-PCB-114	61	PCT_REC			2/6/2002	1.000	
32598-14-4	13C-PCB-105	69	PCT_REC			2/6/2002	1.000	
57465-28-8	13C-PCB-126	72	PCT_REC			2/6/2002	1.000	
52663-72-6	13C-PCB-167	78	PCT_REC			2/6/2002	1.000	
38380-08-4	13C-PCB-156	70	PCT_REC			2/6/2002	1.000	
69782-90-7	13C-PCB-157	70	PCT_REC			2/6/2002	1.000	
32774-16-6	13C-PCB-169	79	PCT_REC			2/6/2002	1.000	
39635-31-9	13C-PCB-189	102	PCT_REC			2/6/2002	1.000	
7012-37-5	13C-PCB-28	85	PCT_REC			2/6/2002	1.000	
39635-32-0	13C-PCB-111	73	PCT_REC			2/6/2002	1.000	
52663-67-9	13C-PCB-178	88	PCT_REC			2/6/2002	1.000	

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PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CRL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE	DUPLICATE
SAMPLE_NO	ZS22
SITE	69A
TISSUE TYPE	Fillet
FRACTION	T
SAMPLE_SIZE	5.0282
SAMPLE_SIZE_UNITS	G WET
PCT_LIPID	
SAMPLE_DATE	
EXTRACT_DATE	1/18/2002
LAB_EXTRACTION_ID	49170-19-04
LAB_ID	49037-38-02

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	0.76	PG/G WET U	99.44	151.45	2/6/2002	1.000	
32598-13-3	PCB-77	27.36	PG/G WET U	99.44	234.68	2/6/2002	1.000	
65510-44-3	PCB-123	16.47	PG/G WET U	99.44	393.08	2/6/2002	1.000	
31508-00-6	PCB-118	1274.48	PG/G WET J	99.44	2943.00	2/6/2002	1.000	
74472-37-0	PCB-114	14.24	PG/G WET U	99.44	202.36	2/6/2002	1.000	
32598-14-4	PCB-105	344.69	PG/G WET J	99.44	968.24	2/6/2002	1.000	
57465-28-8	PCB-126	6.34	PG/G WET U	198.88	108.49	2/6/2002	1.000	
52663-72-6	PCB-167	87.71	PG/G WET U	99.44	193.21	2/6/2002	1.000	
38380-08-4	PCB-156	135.26	PG/G WET JC	99.44	211.21	2/6/2002	1.000	
69782-90-7	PCB-157		PG/G WET C156	99.44	211.21	2/6/2002	1.000	
32774-16-6	PCB-169	1.20	PG/G WET U	99.44	148.96	2/6/2002	1.000	
39635-31-9	PCB-189	11.45	PG/G WET U	99.44	112.27	2/6/2002	1.000	
70362-50-4	13C-PCB-81	83	PCT_REC			2/6/2002	1.000	
32598-13-3	13C-PCB-77	77	PCT_REC			2/6/2002	1.000	
65510-44-3	13C-PCB-123	79	PCT_REC			2/6/2002	1.000	
31508-00-6	13C-PCB-118	70	PCT_REC			2/6/2002	1.000	
74472-37-0	13C-PCB-114	65	PCT_REC			2/6/2002	1.000	
32598-14-4	13C-PCB-105	68	PCT_REC			2/6/2002	1.000	
57465-28-8	13C-PCB-126	73	PCT_REC			2/6/2002	1.000	
52663-72-6	13C-PCB-167	83	PCT_REC			2/6/2002	1.000	
38380-08-4	13C-PCB-156	71	PCT_REC			2/6/2002	1.000	
69782-90-7	13C-PCB-157	71	PCT_REC			2/6/2002	1.000	
32774-16-6	13C-PCB-169	81	PCT_REC			2/6/2002	1.000	
39635-31-9	13C-PCB-189	121	PCT_REC			2/6/2002	1.000	
7012-37-5	13C-PCB-28	79	PCT_REC			2/6/2002	1.000	
39635-32-0	13C-PCB-111	82	PCT_REC			2/6/2002	1.000	
52663-67-9	13C-PCB-178	103	PCT_REC			2/6/2002	1.000	

J = Detected but below the Detection Limit

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N = QC value outside the accuracy or precision criteria goal

C = co-elutes (applicable for PCB 156/157)

PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS_METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE NORMAL
 SAMPLE_NO ZL10
 SITE 69AWF
 TISSUE TYPE Liver
 FRACTION T
 SAMPLE_SIZE 2.5144
 SAMPLE_SIZE_UNITS G WET
 PCT_LIPID
 SAMPLE_DATE
 EXTRACT_DATE 1/18/2002
 LAB_EXTRACTION_ID 49170-19-08
 LAB_ID 49037-38-06

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	<198.85	PG/G WET	U	198.85	302.86	2/6/2002	1.000
32598-13-3	PCB-77	677.71	PG/G WET		198.85	469.30	2/6/2002	1.000
65510-44-3	PCB-123	567.63	PG/G WET	J	198.85	786.07	2/6/2002	1.000
31508-00-6	PCB-118	42566.99	PG/G WET		198.85	5885.30	2/6/2002	1.000
74472-37-0	PCB-114	448.16	PG/G WET		198.85	404.67	2/6/2002	1.000
32598-14-4	PCB-105	8639.21	PG/G WET		79.54	1936.25	2/6/2002	1.000
57465-28-8	PCB-126	200.22	PG/G WET	J	397.71	216.95	2/6/2002	1.000
52663-72-6	PCB-167	3910.30	PG/G WET		198.85	386.37	2/6/2002	1.000
38380-08-4	PCB-156	5116.22	PG/G WET	C	198.85	422.37	2/6/2002	1.000
69782-90-7	PCB-157		PG/G WET	C156	198.85	422.37	2/6/2002	1.000
32774-16-6	PCB-169	59.34	PG/G WET	U	198.85	297.88	2/6/2002	1.000
39635-31-9	PCB-189	679.27	PG/G WET		198.85	224.51	2/6/2002	1.000
70362-50-4	13C-PCB-81	70	PCT_REC				2/6/2002	1.000
32598-13-3	13C-PCB-77	57	PCT_REC				2/6/2002	1.000
65510-44-3	13C-PCB-123	62	PCT_REC				2/6/2002	1.000
31508-00-6	13C-PCB-118	66	PCT_REC				2/6/2002	1.000
74472-37-0	13C-PCB-114	56	PCT_REC				2/6/2002	1.000
32598-14-4	13C-PCB-105	68	PCT_REC				2/6/2002	1.000
57465-28-8	13C-PCB-126	61	PCT_REC				2/6/2002	1.000
52663-72-6	13C-PCB-167	59	PCT_REC				2/6/2002	1.000
38380-08-4	13C-PCB-156	64	PCT_REC				2/6/2002	1.000
69782-90-7	13C-PCB-157	64	PCT_REC				2/6/2002	1.000
32774-16-6	13C-PCB-169	65	PCT_REC				2/6/2002	1.000
39635-31-9	13C-PCB-189	89	PCT_REC				2/6/2002	1.000
7012-37-5	13C-PCB-28	77	PCT_REC				2/6/2002	1.000
39635-32-0	13C-PCB-111	46	PCT_REC				2/6/2002	1.000
52663-67-9	13C-PCB-178	63	PCT_REC				2/6/2002	1.000

J = Detected but below the Detection Limit

U = Not detected; RL reported

N = QC value outside the accuracy or precision criteria goal

C = co-solutes (applicable for PCB 156/157)

PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS_METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CROL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE NORMAL
 SAMPLE_NO ZL09
 SITE 69BWF
 TISSUE_TYPE Liver
 FRACTION T
 SAMPLE_SIZE 2.5409
 SAMPLE_SIZE_UNITS G WET
 PCT_LIPID
 SAMPLE_DATE
 EXTRACT_DATE 1/18/2002
 LAB_EXTRACTION_ID 49170-19-09
 LAB_ID 49037-38-05

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	<196.78	PG/G WET U	196.78	299.70	2/6/2002	1.000	
32598-13-3	PCB-77	1036.39	PG/G WET	196.78	464.40	2/6/2002	1.000	
65510-44-3	PCB-123	772.78	PG/G WET J	196.78	777.87	2/6/2002	1.000	
31508-00-6	PCB-118	48761.46	PG/G WET	196.78	5823.92	2/6/2002	1.000	
74472-37-0	PCB-114	505.99	PG/G WET	196.78	400.45	2/6/2002	1.000	
32598-14-4	PCB-105	10111.68	PG/G WET	78.71	1916.05	2/6/2002	1.000	
57465-28-8	PCB-126	291.82	PG/G WET U	393.56	214.69	2/6/2002	1.000	
52663-72-6	PCB-167	4182.57	PG/G WET	196.78	382.34	2/6/2002	1.000	
38380-08-4	PCB-156	5787.80	PG/G WET C	196.78	417.96	2/6/2002	1.000	
69782-90-7	PCB-157		PG/G WET C156	196.78	417.96	2/6/2002	1.000	
32774-16-6	PCB-169	65.85	PG/G WET U	196.78	294.78	2/6/2002	1.000	
39635-31-9	PCB-189	754.94	PG/G WET	196.78	222.17	2/6/2002	1.000	
70362-50-4	13C-PCB-81	72	PCT_REC			2/6/2002	1.000	
32598-13-3	13C-PCB-77	66	PCT_REC			2/6/2002	1.000	
65510-44-3	13C-PCB-123	55	PCT_REC			2/6/2002	1.000	
31508-00-6	13C-PCB-118	58	PCT_REC			2/6/2002	1.000	
74472-37-0	13C-PCB-114	52	PCT_REC			2/6/2002	1.000	
32598-14-4	13C-PCB-105	65	PCT_REC			2/6/2002	1.000	
57465-28-8	13C-PCB-126	64	PCT_REC			2/6/2002	1.000	
52663-72-6	13C-PCB-167	49	PCT_REC			2/6/2002	1.000	
38380-08-4	13C-PCB-156	61	PCT_REC			2/6/2002	1.000	
69782-90-7	13C-PCB-157	61	PCT_REC			2/6/2002	1.000	
32774-16-6	13C-PCB-169	58	PCT_REC			2/6/2002	1.000	
39635-31-9	13C-PCB-189	69	PCT_REC			2/6/2002	1.000	
7012-37-5	13C-PCB-28	67	PCT_REC			2/6/2002	1.000	
39635-32-0	13C-PCB-111	35	PCT_REC			2/6/2002	1.000	
52663-67-9	13C-PCB-178	53	PCT_REC			2/6/2002	1.000	

J = Detected but below the Detection Limit

U = Not detected; RL reported

N = QC value outside the accuracy or precision criteria goal

C = co-elutes (applicable for PCB 156/157)

PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS_METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CROL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE	DUPLICATE
SAMPLE_NO	ZL09
SITE	69BWF
TISSUE TYPE	Liver
FRACTION	T
SAMPLE_SIZE	2.5334
SAMPLE_SIZE_UNITS	G WET
PCT_LIPID	
SAMPLE_DATE	
EXTRACT_DATE	1/18/2002
LAB_EXTRACTION_ID	49170-19-10
LAB_ID	49037-38-05

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	<197.36	PG/G WET	U	197.36	300.58	2/6/2002	1.000
32598-13-3	PCB-77	1098.16	PG/G WET		197.36	465.78	2/6/2002	1.000
65510-44-3	PCB-123	715.55	PG/G WET	J	197.36	780.18	2/6/2002	1.000
31508-00-6	PCB-118	50691.51	PG/G WET		197.36	5841.16	2/6/2002	1.000
74472-37-0	PCB-114	568.33	PG/G WET		197.36	401.63	2/6/2002	1.000
32598-14-4	PCB-105	10748.04	PG/G WET		78.95	1921.73	2/6/2002	1.000
57465-28-8	PCB-126	300.8	PG/G WET	U	394.73	215.32	2/6/2002	1.000
52663-72-6	PCB-167	4289.53	PG/G WET		197.36	383.48	2/6/2002	1.000
38380-08-4	PCB-156	6348.32	PG/G WET	C	197.36	419.20	2/6/2002	1.000
69782-90-7	PCB-157		PG/G WET	C156	197.36	419.20	2/6/2002	1.000
32774-16-6	PCB-169	52.93	PG/G WET	U	197.36	295.65	2/6/2002	1.000
39635-31-9	PCB-189	825.54	PG/G WET		197.36	222.82	2/6/2002	1.000
70362-50-4	13C-PCB-81	73	PCT_REC				2/6/2002	1.000
32598-13-3	13C-PCB-77	65	PCT_REC				2/6/2002	1.000
65510-44-3	13C-PCB-123	63	PCT_REC				2/6/2002	1.000
31508-00-6	13C-PCB-118	66	PCT_REC				2/6/2002	1.000
74472-37-0	13C-PCB-114	60	PCT_REC				2/6/2002	1.000
32598-14-4	13C-PCB-105	64	PCT_REC				2/6/2002	1.000
57465-28-8	13C-PCB-126	65	PCT_REC				2/6/2002	1.000
52663-72-6	13C-PCB-167	71	PCT_REC				2/6/2002	1.000
38380-08-4	13C-PCB-156	68	PCT_REC				2/6/2002	1.000
69782-90-7	13C-PCB-157	68	PCT_REC				2/6/2002	1.000
32774-16-6	13C-PCB-169	62	PCT_REC				2/6/2002	1.000
39635-31-9	13C-PCB-189	109	PCT_REC				2/6/2002	1.000
7012-37-5	13C-PCB-28	75	PCT_REC				2/6/2002	1.000
39635-32-0	13C-PCB-111	60	PCT_REC				2/6/2002	1.000
52663-67-9	13C-PCB-178	80	PCT_REC				2/6/2002	1.000

J = Detected but below the Detection Limit

U = Not detected; RL reported

N = QC value outside the accuracy or precision criteria goal

C = co-elutes (applicable for PCB 156/157)

PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS_METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CROL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE	NORMAL
SAMPLE_NO	ZS27
SITE	NT18
TISSUE TYPE	Fillet
FRACTION	T
SAMPLE_SIZE	4.0988
SAMPLE_SIZE_UNITS	G WET
PCT_LIPID	
SAMPLE_DATE	
EXTRACT_DATE	1/18/2002
LAB_EXTRACTION_ID	49170-19-05
LAB_ID	49037-38-04

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CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	1.06	PG/G WET U	121.99	185.79	2/6/2002	1.000	
32598-13-3	PCB-77	31.46	PG/G WET U	121.99	287.89	2/6/2002	1.000	
65510-44-3	PCB-123	20.92	PG/G WET U	121.99	482.21	2/6/2002	1.000	
31508-00-6	PCB-118	1660.38	PG/G WET J	121.99	3610.32	2/6/2002	1.000	
74472-37-0	PCB-114	17.47	PG/G WET U	121.99	248.24	2/6/2002	1.000	
32598-14-4	PCB-105	388.61	PG/G WET J	48.79	1187.79	2/6/2002	1.000	
57465-28-8	PCB-126	7.85	PG/G WET U	243.97	133.09	2/6/2002	1.000	
52663-72-6	PCB-167	125.77	PG/G WET J	121.99	237.02	2/6/2002	1.000	
38380-08-4	PCB-156	193.08	PG/G WET JC	121.99	259.10	2/6/2002	1.000	
69782-90-7	PCB-157		PG/G WET C156	121.99	259.10	2/6/2002	1.000	
32774-16-6	PCB-169	2.79	PG/G WET U	121.99	182.74	2/6/2002	1.000	
39635-31-9	PCB-189	24.43	PG/G WET U	121.99	137.72	2/6/2002	1.000	
70362-50-4	13C-PCB-81	94	PCT_REC			2/6/2002	1.000	
32598-13-3	13C-PCB-77	90	PCT_REC			2/6/2002	1.000	
65510-44-3	13C-PCB-123	79	PCT_REC			2/6/2002	1.000	
31508-00-6	13C-PCB-118	78	PCT_REC			2/6/2002	1.000	
74472-37-0	13C-PCB-114	73	PCT_REC			2/6/2002	1.000	
32598-14-4	13C-PCB-105	80	PCT_REC			2/6/2002	1.000	
57465-28-8	13C-PCB-126	81	PCT_REC			2/6/2002	1.000	
52663-72-6	13C-PCB-167	89	PCT_REC			2/6/2002	1.000	
38380-08-4	13C-PCB-156	82	PCT_REC			2/6/2002	1.000	
69782-90-7	13C-PCB-157	82	PCT_REC			2/6/2002	1.000	
32774-16-6	13C-PCB-169	84	PCT_REC			2/6/2002	1.000	
39635-31-9	13C-PCB-189	100	PCT_REC			2/6/2002	1.000	
7012-37-5	13C-PCB-28	89	PCT_REC			2/6/2002	1.000	
39635-32-0	13C-PCB-111	78	PCT_REC			2/6/2002	1.000	
52663-67-9	13C-PCB-178	100	PCT_REC			2/6/2002	1.000	

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PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS_METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CROL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE NORMAL
 SAMPLE_NO ZL11
 SITE 3,18 North Tow - WF
 TISSUE_TYPE Liver
 FRACTION T
 SAMPLE_SIZE 2.0131
 SAMPLE_SIZE_UNITS G WET
 PCT_LIPID
 SAMPLE_DATE
 EXTRACT_DATE 1/18/2002
 LAB_EXTRACTION_ID 49170-19-11
 LAB_ID 49037-38-07

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	16.30	PG/G WET	U	248.37	378.27	2/6/2002	1.000
32598-13-3	PCB-77	963.55	PG/G WET	J	248.37	586.16	2/6/2002	1.000
65510-44-3	PCB-123	638.80	PG/G WET	J	248.37	981.82	2/6/2002	1.000
31508-00-6	PCB-118	49053.25	PG/G WET		248.37	7350.85	2/6/2002	1.000
74472-37-0	PCB-114	503.15	PG/G WET	J	248.37	505.44	2/6/2002	1.000
32598-14-4	PCB-105	10765.79	PG/G WET		99.35	2418.41	2/6/2002	1.000
57465-28-8	PCB-126	265.95	PG/G WET	U	496.75	270.98	2/6/2002	1.000
52663-72-6	PCB-167	4034.53	PG/G WET		248.37	482.59	2/6/2002	1.000
38380-08-4	PCB-156	5852.88	PG/G WET	C	248.37	527.54	2/6/2002	1.000
69782-90-7	PCB-157		PG/G WET	C156	248.37	527.54	2/6/2002	1.000
32774-16-6	PCB-169	56.33	PG/G WET	U	248.37	372.06	2/6/2002	1.000
39635-31-9	PCB-189	704.06	PG/G WET		248.37	280.41	2/6/2002	1.000
70362-50-4	13C-PCB-81	58	PCT	_REC			2/6/2002	1.000
32598-13-3	13C-PCB-77	50	PCT	_REC			2/6/2002	1.000
65510-44-3	13C-PCB-123	51	PCT	_REC			2/6/2002	1.000
31508-00-6	13C-PCB-118	50	PCT	_REC			2/6/2002	1.000
74472-37-0	13C-PCB-114	45	PCT	_REC			2/6/2002	1.000
32598-14-4	13C-PCB-105	51	PCT	_REC			2/6/2002	1.000
57465-28-8	13C-PCB-126	46	PCT	_REC			2/6/2002	1.000
52663-72-6	13C-PCB-167	53	PCT	_REC			2/6/2002	1.000
38380-08-4	13C-PCB-156	50	PCT	_REC			2/6/2002	1.000
69782-90-7	13C-PCB-157	50	PCT	_REC			2/6/2002	1.000
32774-16-6	13C-PCB-169	44	PCT	_REC			2/6/2002	1.000
39635-31-9	13C-PCB-189	79	PCT	_REC			2/6/2002	1.000
7012-37-5	13C-PCB-28	61	PCT	_REC			2/6/2002	1.000
39635-32-0	13C-PCB-111	44	PCT	_REC			2/6/2002	1.000
52663-67-9	13C-PCB-178	50	PCT	_REC			2/6/2002	1.000

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N = QC value outside the accuracy or precision criteria goal

C = co-elutes (applicable for PCB 156/157)

Quality Control Data

PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CRL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE M_BLANK
 SAMPLE_NO
 SITE
 TISSUE TYPE
 FRACTION T
 SAMPLE_SIZE 0.5984
 SAMPLE_SIZE_UNITS G WET
 PCT_LIPID
 SAMPLE_DATE 1/18/2002
 EXTRACT_DATE 49170-19-16
 LAB_EXTRACTION_ID 48401-44-03

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	<835.56	PG/G WET U	835.56	1272.56	2/5/2002	1.000	
32598-13-3	PCB-77	30.40	PG/G WET U	835.56	1971.93	2/5/2002	1.000	
65510-44-3	PCB-123	17.01	PG/G WET U	835.56	3302.97	2/5/2002	1.000	
31508-00-6	PCB-118	999.84	PG/G WET J	835.56	24729.28	2/5/2002	1.000	
74472-37-0	PCB-114	21.06	PG/G WET U	835.56	1700.37	2/5/2002	1.000	
32598-14-4	PCB-105	407.53	PG/G WET J	834.22	8135.86	2/5/2002	1.000	
57465-28-8	PCB-126	<1671.12	PG/G WET U	1671.12	911.60	2/5/2002	1.000	
52663-72-6	PCB-167	25.93	PG/G WET U	835.56	1623.50	2/5/2002	1.000	
38380-08-4	PCB-156	70.08	PG/G WET UC	835.56	1774.73	2/5/2002	1.000	
69782-90-7	PCB-157		PG/G WET C156	835.56	1774.73	2/5/2002	1.000	
32774-16-6	PCB-169	<835.56	PG/G WET U	835.56	1251.67	2/5/2002	1.000	
39635-31-9	PCB-189	<835.56	PG/G WET U	835.56	943.35	2/5/2002	1.000	
70362-50-4	13C-PCB-81	40	PCT_REC			2/5/2002	1.000	
32598-13-3	13C-PCB-77	37	PCT_REC			2/5/2002	1.000	
65510-44-3	13C-PCB-123	37	PCT_REC			2/5/2002	1.000	
31508-00-6	13C-PCB-118	37	PCT_REC			2/5/2002	1.000	
74472-37-0	13C-PCB-114	37	PCT_REC			2/5/2002	1.000	
32598-14-4	13C-PCB-105	36	PCT_REC			2/5/2002	1.000	
57465-28-8	13C-PCB-126	32	PCT_REC			2/5/2002	1.000	
52663-72-6	13C-PCB-167	43	PCT_REC			2/5/2002	1.000	
38380-08-4	13C-PCB-156	40	PCT_REC			2/5/2002	1.000	
69782-90-7	13C-PCB-157	40	PCT_REC			2/5/2002	1.000	
32774-16-6	13C-PCB-169	37	PCT_REC			2/5/2002	1.000	
39635-31-9	13C-PCB-189	53	PCT_REC			2/5/2002	1.000	
7012-37-5	13C-PCB-28	24	PCT_REC N			2/5/2002	1.000	
39635-32-0	13C-PCB-111	36	PCT_REC			2/5/2002	1.000	
52663-67-9	13C-PCB-178	47	PCT_REC			2/5/2002	1.000	

J = Detected but below the Detection Limit

U = Not detected; RL reported

N = QC value outside the accuracy or precision criteria goal

C = co-elutes (applicable for PCB 156/157)

PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE MSD
 SAMPLE_NO ZS27
 SITE NT18
 TISSUE TYPE Fillet
 FRACTION T
 SAMPLE_SIZE 2.7421
 SAMPLE_SIZE_UNITS G WET
 PCT_LIPID
 SAMPLE_DATE
 EXTRACT_DATE 1/18/2002
 LAB_EXTRACTION_ID 49170-19-07
 LAB_ID 49037-38-04

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	107	PCT_REC	182.34	277.71	2/7/2002	1.000	
32598-13-3	PCB-77	102	PCT_REC	182.34	430.33	2/7/2002	1.000	
65510-44-3	PCB-123	150	PCT_REC	182.34	720.80	2/7/2002	1.000	
31508-00-6	PCB-118	243	PCT_REC R	182.34	5396.59	2/7/2002	1.000	
74472-37-0	PCB-114	109	PCT_REC	182.34	371.07	2/7/2002	1.000	
32598-14-4	PCB-105	147	PCT_REC	72.94	1775.46	2/7/2002	1.000	
57465-28-8	PCB-126	106	PCT_REC	364.68	198.94	2/7/2002	1.000	
52663-72-6	PCB-167	117	PCT_REC	182.34	354.29	2/7/2002	1.000	
38380-08-4	PCB-156	121	PCT_REC C	182.34	387.29	2/7/2002	1.000	
69782-90-7	PCB-157		PCT_REC C156	182.34	387.29	2/7/2002	1.000	
32774-16-6	PCB-169	109	PCT_REC	182.34	273.15	2/7/2002	1.000	
39635-31-9	PCB-189	114	PCT_REC	182.34	205.86	2/7/2002	1.000	
70362-50-4	13C-PCB-81	72	PCT_REC			2/7/2002	1.000	
32598-13-3	13C-PCB-77	64	PCT_REC			2/7/2002	1.000	
65510-44-3	13C-PCB-123	56	PCT_REC			2/7/2002	1.000	
31508-00-6	13C-PCB-118	54	PCT_REC			2/7/2002	1.000	
74472-37-0	13C-PCB-114	49	PCT_REC			2/7/2002	1.000	
32598-14-4	13C-PCB-105	51	PCT_REC			2/7/2002	1.000	
57465-28-8	13C-PCB-126	40	PCT_REC			2/7/2002	1.000	
52663-72-6	13C-PCB-167	74	PCT_REC			2/7/2002	1.000	
38380-08-4	13C-PCB-156	64	PCT_REC			2/7/2002	1.000	
69782-90-7	13C-PCB-157	64	PCT_REC			2/7/2002	1.000	
32774-16-6	13C-PCB-169	63	PCT_REC			2/7/2002	1.000	
39635-31-9	13C-PCB-189	89	PCT_REC			2/7/2002	1.000	
7012-37-5	13C-PCB-28	82	PCT_REC			2/7/2002	1.000	
39635-32-0	13C-PCB-111	52	PCT_REC			2/7/2002	1.000	
52663-67-9	13C-PCB-178	67	PCT_REC			2/7/2002	1.000	

J = Detected but below the Detection Limit

U = Not detected; RL reported

N = QC value outside the accuracy or precision criteria goal

C = co-elutes (applicable for PCB 156/157)

PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CRLQ
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE MS
 SAMPLE_NO ZL11
 SITE 69AWF
 TISSUE TYPE Liver
 FRACTION T
 SAMPLE_SIZE 2.0259
 SAMPLE_SIZE_UNITS G WET
 PCT_LIPID
 SAMPLE_DATE
 EXTRACT_DATE 1/18/2002
 LAB_EXTRACTION_ID 49170-19-12
 LAB_ID 49037-38-07

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	105	PCT_REC	246.80	375.88	27/2002	1.000	
32598-13-3	PCB-77	93	PCT_REC	246.80	582.46	27/2002	1.000	
65510-44-3	PCB-123	120	PCT_REC	246.80	975.62	27/2002	1.000	
31508-00-6	PCB-118	-361	PCT_REC R	246.80	7304.41	27/2002	1.000	
74472-37-0	PCB-114	99	PCT_REC	246.80	502.25	27/2002	1.000	
32598-14-4	PCB-105	-9	PCT_REC R	98.72	2403.13	27/2002	1.000	
57465-28-8	PCB-126	123	PCT_REC	493.61	269.26	27/2002	1.000	
52663-72-6	PCB-167	104	PCT_REC	246.80	479.54	27/2002	1.000	
38380-08-4	PCB-156	79	PCT_REC C	246.80	524.21	27/2002	1.000	
69782-90-7	PCB-157		PCT_REC C156	246.80	524.21	27/2002	1.000	
32774-16-6	PCB-169	118	PCT_REC	246.80	369.71	27/2002	1.000	
39635-31-9	PCB-189	108	PCT_REC	246.80	278.64	27/2002	1.000	
70362-50-4	13C-PCB-81	53	PCT_REC			27/2002	1.000	
32598-13-3	13C-PCB-77	54	PCT_REC			27/2002	1.000	
65510-44-3	13C-PCB-123	55	PCT_REC			27/2002	1.000	
31508-00-6	13C-PCB-118	56	PCT_REC			27/2002	1.000	
74472-37-0	13C-PCB-114	51	PCT_REC			27/2002	1.000	
32598-14-4	13C-PCB-105	56	PCT_REC			27/2002	1.000	
57465-28-8	13C-PCB-126	50	PCT_REC			27/2002	1.000	
52663-72-6	13C-PCB-167	58	PCT_REC			27/2002	1.000	
38380-08-4	13C-PCB-156	53	PCT_REC			27/2002	1.000	
69782-90-7	13C-PCB-157	53	PCT_REC			27/2002	1.000	
32774-16-6	13C-PCB-169	45	PCT_REC			27/2002	1.000	
39635-31-9	13C-PCB-189	88	PCT_REC			27/2002	1.000	
7012-37-5	13C-PCB-28	54	PCT_REC			27/2002	1.000	
39635-32-0	13C-PCB-111	46	PCT_REC			27/2002	1.000	
52663-67-9	13C-PCB-178	56	PCT_REC			27/2002	1.000	

J = Detected but below the Detection Limit

U = Not detected; RL reported

N = QC value outside the accuracy or precision criteria goal

C = co-elutes (applicable for PCB 156/157)

PROJECT_NAME USACE-NED RIS Tissues
 LABORATORY BCO
 SDG 49170-19
 ANALYSIS METH MOD 1668A
 CLASS PCB
 CASE
 IDL
 CRDL_CRQL
 FINAL_RESULT
 FINAL_QUAL
 COMMENTS
 VALID_COMMENT

QC_TYPE MSD
 SAMPLE_NO ZL11
 SITE 69AWF
 TISSUE TYPE Liver
 FRACTION T
 SAMPLE_SIZE 1.8027
 SAMPLE_SIZE_UNITS G WET
 PCT_LIPID
 SAMPLE_DATE 1/18/2002
 EXTRACT_DATE 49170-19-13
 LAB_EXTRACTION_ID 49037-38-07

CAS_NO	PARAMETER	LAB_RESULT	UNITS	LAB_QUAL	EML	QL	ANAL_DATE	DIL_FACTOR
70362-50-4	PCB-81	127	PCT_REC		277.36	422.42	2/7/2002	1.000
32598-13-3	PCB-77	118	PCT_REC		277.36	654.57	2/7/2002	1.000
65510-44-3	PCB-123	100	PCT_REC		277.36	1096.41	2/7/2002	1.000
31508-00-6	PCB-118	260	PCT_REC R		277.36	8208.80	2/7/2002	1.000
74472-37-0	PCB-114	105	PCT_REC		277.36	564.43	2/7/2002	1.000
32598-14-4	PCB-105	178	PCT_REC R		110.94	2700.67	2/7/2002	1.000
57465-28-8	PCB-126	149	PCT_REC		554.72	302.60	2/7/2002	1.000
52663-72-6	PCB-167	133	PCT_REC		277.36	538.91	2/7/2002	1.000
38380-08-4	PCB-156	117	PCT_REC C		277.36	589.12	2/7/2002	1.000
69782-90-7	PCB-157		PCT_REC C156		277.36	589.12	2/7/2002	1.000
32774-16-6	PCB-169	143	PCT_REC		277.36	415.49	2/7/2002	1.000
39635-31-9	PCB-189	134	PCT_REC		277.36	313.14	2/7/2002	1.000
70362-50-4	13C-PCB-81	55	PCT_REC				2/7/2002	1.000
32598-13-3	13C-PCB-77	57	PCT_REC				2/7/2002	1.000
65510-44-3	13C-PCB-123	62	PCT_REC				2/7/2002	1.000
31508-00-6	13C-PCB-118	68	PCT_REC				2/7/2002	1.000
74472-37-0	13C-PCB-114	63	PCT_REC				2/7/2002	1.000
32598-14-4	13C-PCB-105	68	PCT_REC				2/7/2002	1.000
57465-28-8	13C-PCB-126	64	PCT_REC				2/7/2002	1.000
52663-72-6	13C-PCB-167	64	PCT_REC				2/7/2002	1.000
38380-08-4	13C-PCB-156	61	PCT_REC				2/7/2002	1.000
69782-90-7	13C-PCB-157	61	PCT_REC				2/7/2002	1.000
32774-16-6	13C-PCB-169	49	PCT_REC				2/7/2002	1.000
39635-31-9	13C-PCB-189	116	PCT_REC				2/7/2002	1.000
7012-37-5	13C-PCB-28	42	PCT_REC				2/7/2002	1.000
39635-32-0	13C-PCB-111	48	PCT_REC				2/7/2002	1.000
52663-67-9	13C-PCB-178	59	PCT_REC				2/7/2002	1.000

J = Detected but below the Detection Limit

U = Not detected; RL reported

N = QC value outside the accuracy or precision criteria goal

C = co-elutes (applicable for PCB 156/157)

Battelle
USACE-NED RIS
TISSUE PCB Data - SDS 49170-19

pg/g wet weight

2L11(6,18 North Tow - WF, liver) MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

ANALYTE	Spike Conc. (pg/g wet)	49170-19-11		49170-19-12		MSD Spike Conc. (pg/g wet)	MSD Dup. Conc. Found (pg/g wet)	Recovery (%)	Alternative Recovery (%)	MSD Background Conc. (pg/g wet)	49170-19-13 MSD Dup. Conc. Found (pg/g wet)	Recovery (%)	Alternative Recovery (%)	MSD RPD (%)	Alternative RPD (%)
		Background Conc. (pg/g wet)	MS Conc. Found (pg/g wet)	Recovery (%)	Background Conc. (pg/g wet)	MS Conc. Found (pg/g wet)									
PCB-81	493.61	16.30	539.09	105	105	554.72	16.30	721.74	127	96.55	554.72	1619.58	126	19	19
PCB-77	493.61	963.55	1420.44	93	97	554.72	963.55	1192.35	118	638.80	554.72	638.80	107	24	24
PCB-123	493.61	638.80	1230.76	120	109	554.72	638.80	4963.25	100	4935.25	50496.63	50496.63	100	18	8
PCB-118	493.61	49053.25	47272.55	-361	R	554.72	49053.25	1086.53	260	R	103	103	102	-1235	R
PCB-114	493.61	503.15	983.40	99	100	554.72	503.15	10751.00	173	R	104	104	103	6	6
PCB-105	493.61	10765.79	10721.46	-9	R	554.72	10765.79	1095.25	178	R	104	104	103	221	R
PCB-126	493.61	265.95	874.57	123	115	554.72	265.95	1095.25	149	1095.25	133	133	133	19	15
PCB-167	493.61	404.53	4549.49	104	100	554.72	404.53	4773.83	133	4034.53	1109.45	4034.53	104	24	3
PCB-156 C	987.22	5852.88	6636.06	79	97	554.72	5852.88	7154.58	117	5852.88	1109.45	5852.88	103	39	6
PCB-157 C156	493.61	443.53	1028.08	118	110	554.72	443.53	1235.58	143	1235.58	103	103	103	19	12
PCB-163*	493.61	704.06	1237.24	108	103	554.72	704.06	1445.60	134	1445.60	103	103	103	21	11

% ALT Recovery is calculated as $(\text{conc. found} / (\text{background conc.} + \text{spike conc.})) * 100$

% Recovery is calculated as $((\text{conc. found} - \text{background conc.}) / \text{spike conc.}) * 100$

R = outside QC limit of <20% RPD or >50-150% recovery

* = concentrations used are from ENPC calculations that include interfering peak

Battelle
 USACE-NED RIS
 TISSUES PCB Data - SDG 49170-19
 pg/g dry weight

DUPLICATE RESULTS (pg/g dry): ZL09(69BWVF, liver)

CAS_NO	ANALYTE	49170-19-09 2L09	49170-19-10 2L09	AVG	STD	%RPD
70362-50-4	PCB-81	ND	ND	NA	NA	NA
32598-13-3	PCB-77	1036.39	1098.16	1067.28	43.68	5.8
65510-44-3	PCB-123	772.78	715.55	744.17	40.47	7.7
31508-00-6	PCB-118	48761.46	50691.51	49726.49	1364.75	3.9
74472-37-0	PCB-114	505.99	568.33	537.16	44.08	11.6
32598-14-4	PCB-105	10111.68	10748.04	10429.86	449.97	6.1
57465-28-8	PCB-126	291.82	300.8	296.31	6.35	3.0
52663-72-6	PCB-167	4182.57	4289.53	4236.05	75.63	2.5
38380-08-4	PCB-156	C	5787.80	6348.32	396.35	9.2
69782-90-7	PCB-157	C156				
32774-16-6	PCB-169	65.85	52.93	59.39	9.14	21.8
39635-31-9	PCB-189	754.94	825.54	790.24	49.92	8.9

NA = result not > 3 x MDL in both samples

ND = not detected.

Battelle
USACE-NED RIS
TISSUE PCB Data - SDG 49170-19
pg/g wet weight

STANDARD REFERENCE MATERIAL RESULTS
Standard Matrix Reference Material 49170-19-14 (CIL EDF 2526)

ANALYTE	CONSENSUS VALUE (pg/g wet)	CONC. FOUND (pg/g wet)	% RECOVERY vs CONSENSUS	% DIFFERENCE vs CONSENSUS
PCB-77	523	391.17	75	25.2
PCB-105	144	119.99	83	16.7
PCB-118	321	357.59	111	11.4
PCB-126	521	387.88	74	25.6
PCB-169	515	443.52	86	13.9

QA/QC Summary

QA/QC NARRATIVE

PROJECT: Rhode Island Sound Disposal Study
PARAMETER: Metals
LABORATORY: Battelle Marine Sciences Laboratory, Sequim, Washington
MATRIX: Tissue

SAMPLE CUSTODY AND PROCESSING: Twelve tissue samples were received for metals analysis. All samples were received in good condition (i.e., all sample containers were intact). The cooler temperature was measured and recorded on arrival. Samples were assigned a Battelle Central File (CF) identification number (1722) and were entered into Battelle's log-in system. The following lists information on sample receipt and processing activities:

	Lab Sample IDs:	1722-241 through -252
	Description:	Tissue samples
Sample split date ^(a)		1/16/02
Sample shipping date		1/17/02
Laboratory arrival date		1/18/02
Cooler temperature on arrival		2.6°C
Deep freeze (-58 °C ± 20 °C) ^(b)		1/18/02
Freeze dried ^(b)		1/30/02 to 12/3/02
Percent moisture determination		2/5/02
Digestion (Aqua regia)		2/5/02
ICP-MS analysis (Ag, As, Be, Cd, Cr, Cu, Ni, Pb, Se, Zn)		2/6/02
CVAA analysis (Hg)		2/6/02

(a) Sample custody as it pertains to metals analysis begins with sample split date. For actual sample collection dates, refer to project field files.

(b) Information transcribed from deep freeze and freeze dryer logs.

DATA QUALITY OBJECTIVES:

Analyte	Analytical Method	Range of Recovery ^(c)	Relative Precision ^(d)	SRM Accuracy ^(e)	Project Detection Limit Goal ($\mu\text{g/g dry wt.}$)	Project Quantitation Limit Goal ($\mu\text{g/g dry wt.}$)	Achieved Detection Limits ($\mu\text{g/g dry wt.}$)
Ag	ICP-MS	70-130%	<30%	<25%	0.25	0.172	0.0107
As	ICP-MS	70-130%	<30%	<25%	5	0.318	0.0915
Be	ICP-MS	70-130%	<30%	<25%	0.5	0.013	0.039
Cd	ICP-MS	70-130%	<30%	<25%	0.5	0.566	0.0096
Cr	ICP-MS	70-130%	<30%	<25%	1	0.763	0.0939
Cu	ICP-MS	70-130%	<30%	<25%	5	0.207	0.0276
Hg	CVAA	70-130%	<30%	<25%	0.1	0.006	0.00163
Ni	ICP-MS	70-130%	<30%	<25%	0.5	0.909	0.0386
Pb	ICP-MS	70-130%	<30%	<25%	0.5	0.064	0.0272
Se	ICP-MS	70-130%	<30%	<25%	0.5	1.27	0.142
Zn	ICP-MS	70-130%	<30%	<25%	5	0.305	0.107

(c) Analyte spike level should be >5 times sample background concentration for use in data quality assessment

(d) Analyte concentrations should be >10 times MDL for use in data quality assessment

(e) Analyte certified value should be >10 times MDL for use in data quality assessment

METHODS: Eleven metals were analyzed: silver, (Ag), arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr) copper (Cu), mercury (Hg), nickel (Ni), lead (Pb), selenium (Se), and zinc (Zn). To prepare the tissues for analysis, they were freeze-dried, then blended in a Spex mixer-mill. Sample percent moisture/dry weight was determined according to Battelle SOP MSL-C-003. Tissue samples were digested using aqua regia according to Battelle SOP MSL-I-024, *Mixed Acid Tissue Digestion*. An approximately 500-mg (dry weight) aliquot of each sample was combined with nitric and hydrochloric acids (aqua regia) in a Teflon bomb

QA/QC NARRATIVE

and heated in an oven at 130°C ($\pm 10^\circ\text{C}$) overnight. After heating and cooling, deionized water was added to the tissue digestate to achieve analysis volume and the digestates were submitted for analysis.

Sample digestates were analyzed for Ag, As, Be, Cd, Cr, Cu, Ni, Pb, Se, and Zn using inductively coupled plasma-mass spectrometry (ICP-MS) according to Battelle SOP MSL-I-022, *Determination of Elements in Aqueous and Digestate Samples by ICP/MS*. This procedure is based on two methods modified and adapted for analysis of solid sample digestates: EPA Method 1693, *Determination of Trace Elements in Ambient Waters by Inductively Coupled Plasma-Mass Spectrometry* and EPA Method 1640, *Determination of Trace Elements in Water by Preconcentration and Inductively Coupled Plasma-Mass Spectrometry*.

Sample digestates were analyzed for Hg using cold-vapor atomic absorption spectroscopy (CVAA) according to Battelle SOP MSL-I-016, *Total Mercury in Tissues and Sediments by Cold Vapor Atomic Absorption*.

All results were reported in units of $\mu\text{g/g}$ on a dry-weight basis and converted to $\mu\text{g/g}$ on a wet-weight basis, calculated using the percent dry weight of each sample. The results for analysis of Pb were reported both as analyzed and blank corrected (see discussion under Method Blanks below); results for analysis for all other metals were not blank corrected.

HOLDING TIMES: The recommended holding times for metals analyses are 28 days from sample collection for Hg analysis and 6 months for analysis of all other metals. Tissue samples were analyzed for Hg within 28 days of sample receipt. Samples were analyzed for all other metals within 6 months of receipt.

DETECTION LIMITS: Laboratory-achieved detection limits based on annual MDL studies for each metal were less than project detection limit goals for all metals. Laboratory MDLs were less than project quantitation limit goals for all metals.

Data qualifiers were used to flag sample concentrations that were determined to be less than the RLs or MDLs as follows:

- U Denotes an undetected sample concentration (zero or a negative number recorded on the instrument printout). The concentration reported is the laboratory-achieved MDL.
- <U Denotes a sample concentration reported that is less than the laboratory-achieved MDL. The concentration recorded on the instrument printout is reported; however, because this value is less than the laboratory MDL it should not be considered a meaningful concentration.
- J Denotes a sample concentration reported that is greater than the laboratory MDL but less than the project QL goal defined in the QAPP. The value should be considered an estimate.

METHOD BLANKS: One method blank was analyzed with the set of tissue samples (at a minimum frequency of 1 per 20 samples). Metals concentrations in the blank were either undetected or detected at concentrations less than 5 times their laboratory-achieved MDLs with the exception of Pb. Pb was detected in the blank at concentrations greater than five times its MDL. The presence of Pb in the blank is most likely due to laboratory contamination of one of the reagents used in sample processing. (This situation has occurred in other projects conducted in the MSL metals laboratory recently. Since the discovery of Pb contamination in method blank analyses, efforts have been made to identify and eliminate the

Sample Data

BATTELLE MARINE SCIENCES LABORATORY
 1529 West Sequim Bay Road
 Sequim, Washington 98382
 (360) 681-3643

RHODE ISLAND SOUND DISPOSAL STUDY

METALS IN TISSUE

MSL Code	Client ID	Site	Tissue Type	Percent Dry Wt	Analysis: (Concentrations in µg/g WET wt.)					
					ICP-MS 020602-5000a	ICP-MS 020602-5000a	ICP-MS 020602-5000a	ICP-MS 020602-5000a	ICP-MS 020602-5000a	ICP-MS 020602-5000a
1722-241 r1	ZS19	69A	Fillet	22.7	0.00243 J	0.617	0.01 <U	0.0192 J	0.386	0.225
1722-241 r2	ZS19	69A	Fillet	22.7	0.00279 J	0.592	0.01 <U	0.0188 J	0.447	0.229
1722-241 r3	ZS19	69A	Fillet	22.7	0.00250 J	0.670	0.01 <U	0.0187 J	0.404	0.234
1722-242	ZS20	69A	Fillet	22.2	0.00194 U	2.69	0.01 <U	0.0043 J	0.404	0.435
1722-243	ZS21	69A	Fillet	21.9	0.00618 J	1.66	0.01 <U	0.0039 J	0.431	0.456
1722-244	ZS22	69A	Fillet	21.0	0.00526 J	7.20	0.01 <U	0.0013 U	0.447	0.152
1722-245	ZS23	69B	Fillet	22.7	0.00190 U	0.863	0.01 <U	0.0095 J	0.434	0.284
1722-246	ZS24	69B	Fillet	21.9	0.00298 J	2.19	0.01 <U	0.0032 J	0.460	0.484
1722-247	ZS25	69B	Fillet	20.4	0.0117 J	4.24	0.01 <U	0.00089 U	0.355	0.237
1722-248	ZS26	NT18	Fillet	21.1	0.00753 J	0.901	0.01 <U	0.0131 J	0.445	0.272
1722-249	ZS27	NT18	Fillet	20.9	0.00558 J	4.41	0.01 <U	0.0014 U	0.362	0.191
1722-250	ZL09	69BWF	Liver	40.4	0.196	5.17	0.01 <U	0.116 J	0.529	13.6
1722-251	ZL10	69AWF	Liver	40.1	0.183	4.81	0.01 <U	0.141 J	0.421	11.7
1722-252	ZL11	16.18 North Tow	Liver	36.6	0.296	3.33	0.01 <U	0.113 J	0.425	17.8
Blank r2	(Mean % Dry Wt.)			25.5	0.00906	0.113	0.01 <U	0.00452 J	0.108	0.00375 U
DRY Wt. Laboratory Achieved Detection Limits					0.0107	0.0915	0.039	0.0096	0.0339	0.0276
DRY Wt. Project QL (From QAPP)					0.172	0.318	0.013	0.566	0.763	0.207
WET Wt. Laboratory Achieved Detection Limits (a)					0.003	0.02	0.01	0.002	0.024	0.0070
WET Wt. Project QL (a)					0.044	0.081	0.0033	0.144	0.195	0.053

NA Not applicable/available

U Not detected above Laboratory Achieved DL

<U Undetected (zero); Laboratory DL reported

J Reported below Project DL Goal, above Laboratory DL

(a) Wet weight Laboratory Achieved DL and Project QL calculated using dry weight DLs and QLs and mean percent dry weight for all tissue samples.

BATTELLE MARINE SCIENCES LABORATORY
 Sequim, Washington 98382
 (360) 681-3643

RHODE ISLAND SOUND DISPOSAL STUDY
 METALS IN TISSUE

MSL Code	Client ID	Instrument: Analytical Batch ID: Percent Dry Wt	CV/AA 020602-HGB2	ICP-MS 020602-5000a	(concentrations in $\mu\text{g/g}$ WET wt.)			ICP-MS 020602-5000a	ICP-MS 020602-5000a
					Ni	Pb	Blank-Corrected Pb		
1722-241 11	2S19	22.7	0.0304	0.0279 J	0.0511 B	0.0009 U	0.365	5.56	
1722-241 12	2S19	22.7	0.0304	0.0223 J	0.0540 B	0.0039 U	0.388	4.24	
1722-241 13	2S19	22.7	0.0281	0.0263 J	0.0465 B	0.0062 <U	0.375	7.45	
1722-242	2S20	22.2	0.0524	0.141 J	0.0630 B	0.0140 J	0.573	4.86	
1722-243	2S21	21.9	0.0731	0.0957 J	0.0611 B	0.0127 J	0.523	5.08	
1722-244	2S22	21.0	0.0311	0.0582 J	0.0567 B	0.0103 J	0.464	7.43	
1722-245	2S23	22.7	0.0375	0.0232 J	0.0568 B	0.0066 J	0.368	5.45	
1722-246	2S24	21.9	0.0475	0.102 J	0.0729 B	0.0245	0.572	3.83	
1722-247	2S25	20.4	0.0275	0.0626 J	0.0547 B	0.0096 J	0.418	6.41	
1722-248	2S26	21.1	0.0498	0.0439 J	0.0477 B	0.0011 U	0.384	5.74	
1722-249	2S27	20.9	0.0224	0.0688 J	0.0650 B	0.0188	0.458	8.86	
1722-250	2L09	40.4	0.0279	0.116 J	0.238 B	0.149	1.54	42.0	
1722-251	2L10	40.1	0.0241	0.0638 J	0.261 B	0.173	1.41	40.0	
1722-252	2L11	36.6	0.0305	0.0681 J	0.194 B	0.113	1.71	46.5	
Blank 2	(Mean % Dry Wt.)	25.5	0.0004 <U	0.003 U	0.0564 B	0.0069 <U	0.162	0.0939	
DRY Wt. Laboratory Achieved Detection Limits		0.00163	0.0386	0.0272	0.0272	0.142	0.107		
DRY Wt. Project QL (From QAPP)		0.006	0.909	0.064	0.064	1.27	0.305		
WET Wt. Laboratory Achieved Detection Limits ^(a)		0.0004	0.0099	0.0069	0.0069	0.036	0.027		
WET Wt. Project QL ^(a)		0.002	0.232	0.016	0.016	0.324	0.078		
			--	--	--	--	--	--	

NA Not applicable/available

U Not detected above Laboratory Achieved DL

<U Undetected (zero); Laboratory DL reported

J Reported below Project DL Goal, above Laboratory DL

Quality Control Data

BATTELLE MARINE SCIENCES LABORATORY
 1529 West Sequim Bay Road
 Sequim, Washington 98382
 (360) 681-3643

RHODE ISLAND SOUND DISPOSAL STUDY
METALS IN TISSUE

RHODE ISLAND SOUND DISPOSAL STUDY METALS IN TISSUE							
(concentrations in $\mu\text{g/g}$ DRY wt.)							
MSL Code	Client ID	Dry Wt	Ag	As	Be	Cd	Cr
Blank r2		0.0355	0.444	0.039 <U	0.0177 J	0.424	0.0147 U
Laboratory Achieved Detection Limits		0.0107 0.172	0.0915 0.318	0.039 0.013	0.0096 0.566	0.0939 0.763	0.0276 0.207
Laboratory Control Sample Accuracy							
LCS L1		8.99	9.92	8.96	9.76	10.2	9.59
Spike Concentration		10	10	10	10	10	10.0
Percent Recovery		90%	99%	90%	98%	102%	96%
LCS L2		48.9	48.7	45.0	49.4	48.5	47.6
Spike Concentration		50	50	50	50	50	50.0
Percent Recovery		98%	97%	90%	99%	97%	95%

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RHODE ISLAND SOUND DISPOSAL STUDY
METALS IN TISSUE

(concentrations in $\mu\text{g/g DRY wt}$)

MSL Code	Client ID	Dry Wt	Hg	Ni	Pb	ICP-MS		ICP-MS	ICP-MS
						CVAA	020602HGB2	ICP-MS	020602-5000a
Blank r2		0.00163 <U		0.0116 U	0.221 B			0.0272 <U	
Achieved Laboratory Detection Limits		0.00163		0.0386	0.0272			0.064	
Project QL (3.18* Achieved DL)		0.006		0.909	0.064				
Laboratory Control Sample Results									
LCS L1		0.792		9.6	10.5 B			10.3	
Spike Concentration		1.0		10	10			10	
Percent Recovery		79%		96%	105%			103%	
LCS L2		--		47.9	52.4 B			52.2	
Spike Concentration		--		50	50			50	
Percent Recovery		--		96%	105%			104%	
									97%
									92%
									90%

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RHODE ISLAND SOUND DISPOSAL STUDY
METALS IN TISSUE

MSL Code	Client ID	Matrix Spike/Matrix	Spike Duplicate Accuracy & Precision	(concentrations in $\mu\text{g/g DRY wt.}$)					
				Dry Wt	Ag	As	Be	Cd	Cr
Spike Concentration				10	10	10	10	10	10
1722-246	2S24	21.9	0.0136 J	9.99	0.039 <U	0.0145 J	2.10	2.21	
1722-246 MS 1				9.16	19.3	8.86	9.64	12.1	11.6
1722-246 MSD 1				9.20	19.9	8.65	9.55	12.0	11.5
Percent Recovery - MS 1				91%	93%	89%	96%	100%	94%
Percent Recovery - MSD 1				92%	99%	87%	95%	99%	93%
RPD MS 1/MSD 1				0%	6%	2%	1%	1%	1%
Spike Concentration				50	50	50	50	50	50
1722-246	2S24	21.9	0.0136 J	9.99	0.039 <U	0.0145 J	2.10	2.21	
1722-246 MS 2				47.6	58.8	44.0	47.8	51.3	48.7
1722-246 MSD 2				46.9	57.7	43.4	47.3	49.9	47.8
Percent Recovery - MS 2				95%	98%	88%	96%	98%	93%
Percent Recovery - MSD 2				94%	95%	87%	95%	96%	91%
RPD MS 2/MSD 2				1%	2%	1%	1%	3%	2%

NA Not applicable/available

NS Not spiked

U Not detected above Laboratory Achieved DL

<U Undetected (zero); Laboratory DL reported

J Reported below Project DL Goal; above Laboratory DL

N QC value outside the accuracy or precision criteria goal

RSD Relative standard deviation

RPD Relative percent difference

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RHODE ISLAND SOUND DISPOSAL STUDY
METALS IN TISSUE

MSL Code	Client ID	Matrix Spike/Matrix Duplicate Accuracy & Precision	(concentrations in $\mu\text{g/g}$ DRY wt)					
			Dry Wt	Hg	Ni	Pb	Blank-Corrected	ICP-MS
Analysis:	CVAAs	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	020602-5000a	ICP-MS
Analytical Batch ID:	020602HGB2	020602-5000a	020602-5000a	020602-5000a	020602-5000a	020602-5000a	020602-5000a	020602-5000a
Percent						Pb		Zn
Spike Concentration		1.0		10	10	10	10	10.0
1722-246	2S24	21.9	0.217	0.465 J	0.333 B	0.112	2.61	17.5
1722-246 MS1			1.13	10.0	10.8 B	10.6	11.9	27.0
1722-246 MSD1			1.12	9.87	10.4 B	10.2	11.6	26.4
Percent Recovery - MS 1		91%		95%	105%	105%	93%	95%
Percent Recovery - MSD 1		90%		94%	101%	101%	90%	89%
RPD MS 1/MSD 1		1%		1%	4%	4%	3%	7%
Spike Concentration		--		50	50	50	50	50.0
1722-246	2S24	21.9	0.217	0.465 J	0.333 B	0.112	2.61	17.5
1722-246 MS2		--		48.0	52.6 B	52.4	48.1	59.9
1722-246 MSD2		--		47.1	50.6 B	50.4	46.6	59.6
Percent Recovery - MS		--		95%	105%	105%	91%	85%
Percent Recovery - MSD		--		93%	101%	101%	88%	84%
RPD MS 2/MSD 2		--		2%	4%	4%	3%	1%

NA Not applicable/available

NS Not spiked

U Not detected above Laboratory Achieved DL

<U Undetected (zero); Laboratory DL reported

J Reported below Project DL Goal, above Laboratory DL

N QC value outside the accuracy or precision criteria goal

RSD Relative standard deviation

RPD Relative percent difference

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RHODE ISLAND SOUND DISPOSAL STUDY
METALS IN TISSUE

MSL Code	Client ID	Dry Wt	Ag	As	Be	Cd	Cr	Cu	(concentrations in $\mu\text{g/g}$ DRY wt.)		
									ICP-MS	ICP-MS	ICP-MS
1566B r2			0.482	5.90	0.039 <U	2.32	1.99	63.4			
	Certified Value		0.666	7.65	NC	2.48	NC	71.6			
	Range		± 0.009	± 0.65	NC	± 0.08	NC	± 1.6			
	Percent Difference		28% N	23%	NA	6%	NA	11%			
DORM-2			0.0483 J	15.0	0.039 <U	0.0535 J	31.8	1.94			
	Certified Value		0.041	18.0	NC	0.043	34.7	2.34			
	Range		± 0.013	± 1.10	NC	± 0.008	± 5.50	± 0.16			
	Percent Difference		18%	17%	NA	24%	8%	17%			
DOLT-2 r1			0.479	11.0	0.039 <U	19.1	1.52	24.7			
	Certified Value		0.608	16.6	NC	20.8	0.37	25.8			
	Range		± 0.032	± 1.10	NC	± 0.50	± 0.08	± 1.1			
	Percent Difference		21%	34% N	NA	8%	311% N	4%			
Replicate Precision											
1722-241 r1	2S19	22.7	0.0107 J	2.72	0.039 <U	0.0844 J	1.70	0.989			
1722-241 r2	2S19	22.7	0.0123 J	2.61	0.039 <U	0.0827 J	1.97	1.01			
1722-241 r3	2S19	22.7	0.0110 J	2.95	0.039 <U	0.0825 J	1.78	1.03			
	Mean		0.0113	2.76	0.039 <U	0.0832	1.82	1.01			
	RSD		8%	6%	NA	1%	8%	2%			

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RHODE ISLAND SOUND DISPOSAL STUDY
METALS IN TISSUE

(concentrations in $\mu\text{g/g}$ DRY wt)									
MSL Code	Client ID	Dry Wt	Hg	Ni	Pb	ICP-MS	ICP-MS	ICP-MS	ICP-MS
Standard Reference Material Accuracy									
1566B r2									
Certified Value									
Range									
Percent Difference									
DORM-2									
Certified Value									
Range									
Percent Difference									
DOLT-2 r1									
Certified Value									
Range									
Percent Difference									
Replicate Precision									
1722-241 r1	2S19	22.7	0.134	0.123 J	0.225 B	0.0040 U	1.61	24.5	
1722-241 r2	2S19	22.7	0.134	0.0984 J	0.238 B	0.0170 U	1.71	18.7	
1722-241 r3	2S19	22.7	0.124	0.116 J	0.205 B	0.0272 <U	1.65	32.8	
Mean			0.131	0.112	0.223 B	NA	1.66	25.3	
RSR			4%	11%	7%	NA	3%	28%	